VERTEBRATE FAUNA OF AN ISOLATED BUSHLAND RESERVE (NO 18325) IN INNER PERTH.

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ABSTRACT

Inglewood Reserve (No 18325), an isolated 1 ha of urban bushland has 8 reptile, 1 frog and 23 bird species. No native mammals have been recorded. This study highlights the importance to reptile and bird species of maintaining small reserves within the metropolitan area.

INTRODUCTION

The social and political importance of urban bushland to the community has been highlighted by the formation of many local interest groups under the umbrella of the Urban Bushland Council. Local Shire Councils have recognised community concern by retaining and protecting local reserves.

Recent work by the Western Australian Museum has illustrated the significance of urban bushland remnants to the fauna of the Perth region, with species numbers related to reserve size, (How and Dell, 1989, 1993, 1994). Reserves as small as 4ha have been shown to be important to fauna conservation (Turpin, 1990, 1991a) but many species persist on reserves smaller than this (Turpin, 1991b).

This study was initiated to determine the fauna of a very small remnant (1ha) at Inglewood, Perth. This reserve is one of the smallest areas of remnant bushland to be systematically studied in the Perth region.

STUDY AREA AND METHODS

Inglewood Reserve No 18325, vested with the City of Stirling, occupies an area of 1ha. It is bounded on three sides by Walter Road, Hamer parade and Eighth Avenue and is locally known as 'the Triangle'. The area has been isolated by roads for many decades but is within the 'green-belt' zone consisting of Hamer Park, Mount Lawley Golf Club, Inglewood Reserve, Inglewood Kiev Soccer Club and McAuley Park. The Reserve has been fenced by Stirling Shire Council to preserve it for recreational and educational uses. The perimeter has been sprayed to kill introduced grasses.

The Reserve is situated on the junction of the Spearwood and Bassendean Dune Systems. It is a remnant *Banksia* woodland and has a rich vegetation assemblage consisting

of about 100 plant species (J. Dell, pers.comm.).

Vertebrate sampling sites were established in July 1993 when nine 20 litre buckets, placed 10 m apart, were used as pitfall traps. A seven metre flywire fence standing 30 cm high was placed vertically over each trap when they were opened.

One line of three traps was placed in the eastern, or Bassendean Sand section (1WA) of the Reserve and the other two lines were placed in the western, or Spearwood Sand section (1WB,1WC). The traps were opened on the following dates:– August 22–29;October 18–24; October 25–31; November 21– December 5; January 24–February 5; March 14–26; a total of 58 nights. Traps were closed and sealed and the flywire fence removed between trapping periods.

Traps were examined every morning at 0600hr and all reptiles, amphibians and mammals were identified, measured, marked and released.

Birds were recorded opportunistically whilst checking the fenced pitlines. Headtorching for geckos was carried out on three nights when the ambient temperature after sundown was above 18°C.

A search was carried out of the Western Australian Museum's faunal database to find historical records of mammals and reptiles from the Inglewood (Ing) and the adjacent Mount Lawley (MtL) areas.

The Szymkiewicz-Simpson (Iszs) similarity index with UPGMA clustering of the matrix was carried out to compare the lizard assemblages present in Inglewood with four other inner urban bushland sites in Perth using the statistical program BIODIV. The two Spearwood trap lines (1WB,1WC) and the Bassendean trap line (1WA) were also compared using the same technique.

RESULTS

Mammals

Only the introduced House Mouse, *Mus musculus* was trapped but the reserve is used by domestic cats and dogs. No bats were observed or heard calling in the reserve. From a search of records of the Western Australian Museum for the Mount Lawley area, the only native mammals are the Chocolate Wattled Bat, *Chalinolobus morio*, in 1924, and the Brush-tailed Phascogale, *Phascogale tapoatafa*, in 1945; Phascogales are no longer present in the Perth metropolitan area.

Herpetofauna

One species of frog and eight reptiles (Table 1) were recorded during the trapping period. No dragons, varanids, geckos or snakes were recorded.

Skinks were the most diverse group of reptiles in the reserve; *Cryptoblepharus plagiocephalus, Ctenotus fallens, Ctenotus lesueurii, Hemiergis quadrilineatus, Lerista praepedita, Menetia greyii* and *Tiliqua rugosa* were recorded. *T.rugosa*, only recorded as a skin on Inglewood was seen successfully crossing Walter Road from the Mt Lawley Golf Club grounds to the reserve in October 1995.

Historical records of the Western Australian Museum list two skinks from Mount Lawley (MtL) not caught during this study:– *Lerista distinguenda* (1945) and *Tiliqua occipitalis* (1932) and one legless lizard, *Lialis burtonis* (MtL 1953; Ing 1948). The

Table 1. Herpetofauna of study areas in the central urban areas of the Perth Metropolitan region. IW – Inglewood, M1 – Reserve South Perth, M2 Reserve South Perth, KP – Kings Park, TH – Tuart Hill, LG – Local gardens. The number of individuals of each species trapped in the three main areas of Inglewod are also presented.

Species	STUDY AREAS INGLEWOOD IW	M1	M2	KP	TH	LG	IW A	IW B	IW C
GEKKONIDAE (Geckos)									
Diplodactylus alboguttatus	–	x	–	–	–	–	–	–	–
Diplodactylus polyophthalmus	–	–	–	x	–	–	–	–	–
Phyllodactylus marmoratus	–	x	–	x	x	x	–	–	–
Underwoodisaurus milii	–	–	–	x	–	–	–	–	–
PYGOPODIDAE(Legless Lizards)									
Aprasia repens	x	–	–	x	x	–	1	4	1
Lialis burtonis	–	x	–	x	–	–	–	–	–
Pletholax gracilis	–	x	–	–	x	–	–	–	–
AGAMIDAE (Dragon Lizards)									
Pogona minor	–	x	–	x	x	–	–	–	–
Tympanocryptis adelaidensis	–	x	–	–	–	–	–	–	–
SCINCIDAE (Skink Lizards)									
Cryptoblepharus plagiocephalus	x	x	–	x	x	x	–	1	–
Ctenotus fallens	x	x	–	x	x	–	11	1	1
Ctenotus lesueurii	x	x	x	x	x	–	1	2	1
Hemiergis quadrilineata	x	x	–	x	x	x	1	2	2
Lerista elegans	–	x	x	x	x	x	–	–	–
Lerista lineopunctulata	–	–	x	x	–	–	–	–	–
Lerista praepedita	x	–	–	x	x	–	2	1	1
Menetia greyii	x	x	x	x	x	x	2	6	3
Morethia lineoocellata	–	–	–	x	x	–	–	–	–
Morethia obscura	–	–	–	x	x	–	–	–	–
Tiliqua occipitalis	–	x	–	–	–	–	–	–	–
Tiliqua rugosa	s	x	x	x	x	x	–	–	–
VARANIDAE (Goannas)									
Varanus gouldii	–	–	–	x	–	–	–	–	–
TYPHLOPIDAE (Blind Snakes)									
Ramphotyphlops australis	–	x	–	x	–	–	–	–	–
ELAPIDAE(Front-Fanged Snakes)									
Demansia psammophis	–	–	–	x	–	–	–	–	–
Pseudonaja affinis	–	–	–	x	x	–	–	–	–
Simoselaps bertholdi	–	–	–	x	–	–	–	–	–
LEPTODACTYLIDAE(Ground Frogs)									
Limnodynastes dorsalis	x	x	–	–	x	–	2	–	–
Myobatrachus gouldii	–	–	–	x	x	–	–	–	–

Table 2. Birds recorded from Inglewood. *Introduced Species, +Colonised Naturally. IW; birds recorded for the study area; SA: birds recorded from local gardens and parks; GC: birds recorded by Majors (1988).

Species	IW	SA	GC
ACCIPITRIDAE			
Black-shouldered Kite *Elanus caeruleus*		x	
Brown Goshawk *Accipiter fasciatus*			
FALCONIDAE		x	
Australian Kestrel *Falco cenchroides*	x	x	
Australian Hobby *Falco longipennis*	x	x	
COLUMBIDAE			
*Domestic Pigeon *Columba livia*	x	x	
*Spotted Dove *Streptopelia chinensis*	x	x	
*Laughing Dove *Streptopelia senegalensis*	x	x	
PSITTACIDAE			
*Rainbow Lorikeet *Trichoglossus haematodus*	x	x	
Ring-necked Parrot *Platycercus zonarius*		x	
Carnaby's Cockatoo *Calyptorhynchus latirostris*			
Red-tailed Black Cockatoo *Calyptorhynchus magnificus*	x	x	
*Corella *Cacatua* sp		x	
+Galah *Cacatua roseicapilla*	x	x	
CUCULIDAE			
Pallid Cuckoo *Cuculus pallidus*		x	
ALCEDINIDAE			
*Laughing Kookaburra *Dacelo gigas*	x	x	
MEROPIDAE			
Rainbow Bee-eater *Merops ornatus*		x	
HIRUNDINIDAE			
Welcome Swallow *Hirundo neoxena*	x	x	
Tree Martin *Hirundo nigricans*	x	x	
CAMPEPHAGIDAE			
Black-faced Cuckoo-shrike *Coracina novaehollandiae*		x	
PACYCEPHALIDAE			
Rufous Whistler *Pachycephala rufiventris*	x	x	x
MONARCHIDAE			
Willy Wagtail *Rhipidura leucophrys*	x	x	
ACANTHIZIDAE			
Western Flyeater *Gerygone fusca*	x	x	
Yellow-rumped Thornbill *Acanthiza chrysorrhoa*			x
DAPHOENOSITTIDAE			
Australian Sittella *Daphoenositta chrysoptera*		x	
Mistletoebird *Dicaeum hirundinaceum*		x	

Species	IW	SA	GC
PARDALOTIDAE			
Striated Pardalote *Pardalotus striatus*	x	x	
ZOSTEROPIDAE			
Grey-breasted White-eye *Zosterops lateralis*		x	
MELIPHAGIDAE			
Brown Honeyeater *Lichmera indistincta*	x	x	
Singing Honeyeater *Meliphaga virescens*	x	x	
White-cheeked Honeyeater *Phylidonyris nigra*		x	
Western Spinebill *Acanthorhynchus superciliosus*			x
Red Wattlebird *Anthochaera carunculata*	x	x	
Little Wattlebird *Anthochaera chrysoptera*	x	x	
GRALLINIDAE			
Magpie-lark *Grallina cyanoleuca*	x	x	
CRACTICIDAE			
Australian Magpie *Cracticus tibicen*	x	x	
Grey Butcherbird *Cracticus torquatus*	x	x	x
CORVIDAE			
Australian Raven *Corvus coronoides*	x	x	

following snakes (locality and last date of collection in brackets) were collected:- Bardick, *Notechis curtus* (MtL 1932); Tiger Snake, *Notechis scutatus* (MtL 1920; Ing 1944); Dugite, *Pseudonaja affinis* (MtL 1964; Ing 1940); Gould's Snake, *Rhinoplocephalus gouldii*, (MtL 1962); Jan's Banded Snake, *Vermicella bertholdi* (MtL 1963); Black-naped Snake, *V.bimaculata* (MtL1935; Ing 1938); Black-lined Snake, *V.calonotus* (MtL 1949; Ing 1952); Southern Shovel-nosed Snake, *V.semifasciata* (Ing 1953).

The lizard fauna of Inglewood was compared with that of Kings Park (How and Dell, 1994), a 12 ha reserve in Tuart Hill– Lot 50, Cottonwood Cres.,(unpublished data) and two small reserves in Victoria Park (Turpin, 1990, 1991a,b). Figure 1 shows that all Inglewood species are found in Kings Park and all but one of the species at Tuart Hill. Inglewood is least similar to the two Victoria Park sites south of the Swan River.

Comparison of the two Spearwood and one Bassendean sand type pit lines within the reserve shows that there is little difference between the assemblages on these landforms. The greatest difference occurs between 1WC (situated amongst Banksia trees) and 1WA and 1WB (no Banksia trees).

Avifauna

Twenty-three species of bird were recorded from the reserve (Table 2). Those birds recorded in surrounding areas and those recorded by Majors (1988) in the land adjacent on the golf

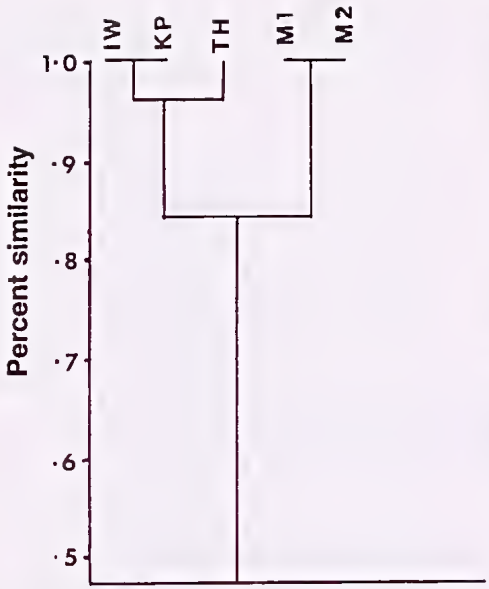

Figure 1. Szymkiewicz-Simpson (lszs) similarity index with UPGMA clustering of lizard species present in Inglewood (IW), Kings Park (KP), Tuart Hill (TH), Reserve No. 3694 South Perth (M1), Reserve, Berwick St, South Perth (M2).

course are also presented in Table 2. Of the birds recorded, 10 are Non-passerines and 14 are Passserines. All of the species recorded from the Inglewood reserve were also recorded in local gardens and parks. However, Majors (1988) recorded two species (Yellow-rumped Thornbill and Western Spinebill) at Mt Lawley Golf Course not recorded elsewhere in the area.

DISCUSSION

No native mammals were recorded in the reserve. The closest bush areas that have native mammals are at Tuart Hill, Lot 50, Cottonwood Cres., where the Grey Kangaroo, *Macropus fuliginosus* occurs. A bush area near Mirrabooka has the Brush-tailed Wallaby, *M.irma* (J. Dell, pers.comm). Few bats are likely to use the reserve for roosting as there are no tree hollows but they may roost in hollows in nearby Mount Lawley Golf Club grounds. The White-striped Mastiff Bat, *Tadarida australis*, flies over adjacent houses at night and was identified by its characteristic call.

How and Dell (1993) discussed the major loss of mammal species on the Swan Coastal Plain since settlement, even in large areas. It is expected that small isolated remnants will be even more susceptible to loss of native species.

The Banjo Frog is widespread in the metropolitan area. It is found near permanent water in winter months

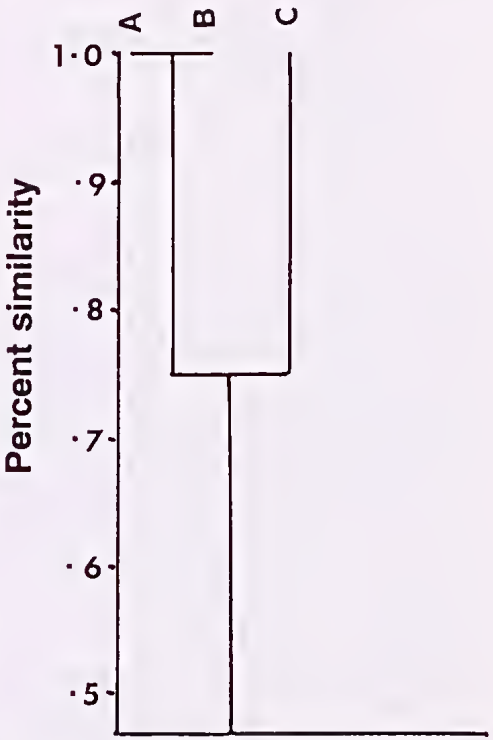

Figure 2. Szymkiewicz-Simpson (lszs) similarity index with UPGMA clustering of lizard species present in the three sites in Inglewood: IWA, IWB and IWC.

and inhabits a burrow during arid, summer conditions. In Inglewood it was present only on Bassendean sands.

Arboreal (*Cryptoblepharus plagiocephalus*), fossorial (*Lerista praepedita* and *Aprasia repens)* and epigeic (all other skinks listed on Table 1) lizards are all represented in the reserve.

Eight species of snake were previously recorded in the Mount Lawley-Inglewood area. The absence of snakes, varanids and dragons in the reserve reflects the small size of the reserve. Also these are usually the first families of reptiles lost from small remnants (How and Dell, 1994).

Although common in adjacent gardens and houses,the Marbled Gecko, *Phyllodactylus marmoratus,* was not recorded in the reserve, presumably because there are few hollows and little peeling bark on the trees in the reserve for the animals to live in. Another species of reptile that occurs in nearby gardens (*Lerista elegans*), surprisingly, was not recorded in the reserve.

The similarity of the skink fauna of Inglewood and Kings Park compared to Victoria Park may reflect the shorter trapping period at the latter site or the difference in substrate between the sites. Kings Park, Tuart Hill and Inglewood are on Spearwood Sands with the eastern section of Inglewood on Bassendean Sands. Victoria Park is situated on Bassendean Sands. Bassendean Sands are remnants of old coastal dunes formed during the Pleistocene with heavily leached grey or siliceous white sands. The yellow calcareous sands of the Spearwood Dune system are richer in reptiles and the Swan River has been shown to be an important zoogeographic barrier (How and Dell 1994).

The distribution of reptiles over the reserve is not uniform. There were no captures of *Aprasia repens* or *Lerista praepedita* (both fossorial) in site C while the arboreal *Crytoblepharus plagiocephalus* was only captured in site C.

Although only 23 species of birds were recorded from the reserve, at least 37 species are common in surrounding areas (Table 2).

The reserve,which has an upper storey of 4 species of *Banksia,* is used mainly by nectarivorous birds. These species, which are also insectivorous, are opportunistic feeders. There are no purely insectivorous birds e.g. wrens, scrubwrens, robins or shrike-thrushes which reflects both the small size of the reserve and the disturbed nature of the reserve and of the surrounding areas.

The reserve is important for some birds, e.g. the Brown Honeyeater, which frequents gardens but breed mainly in bushlands. Migrant species, e.g. Black-faced Cuckoo-shrikes, Tree Martins and Rainbow Bee-eaters also use the reserve for rest and feeding during their passage through the metropolitan area.

This study confirms the importance of maintaining reserves as small as 1ha in the metropolitan area. More species of reptile occur in Inglewood than survive in local gardens, indicating that natural vegetation is important to the survival of many species. This study also highlights the significance of isolated reserves like Inglewood for transient, migrant and sedentary bird species. The reservation of numerous areas of natural vegetation enhances species persistence against catastrophies such as fire.

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